Canon Paleo Curriculum
Unit:3 Evolution
Lesson Plan 2

Activity Name: Fashion a Fish Overview

Adapted from Project Wild Aquatic

Grades: 9-10

Objectives: Students will describe adaptations of fish to their environments, describe how adaptations can help fish survive in their habitat and interpret the importance of adaptations of animals. The major purpose of this activity is for students to investigate the concept of adaptation in fish.

State Standard Met: Science 3.1, 3.4

Materials: Five cards for each adaptations from the masters provided, mouth, body shape, coloration, reproduction, art materials, paper.

Background: Aquatic animals are the product of countless adaptations over long periods of time. These adaptations, for the most part, are features that increase the animals' likelihood of surviving in their habitat.

When a habitat changes, either slowly or catastrophically, the species of with adaptations that allow them many options are the ones most likely to survive. Some species have adapted to such a narrow range of habitat conditions that they are extremely vulnerable to change. They are usually more susceptible than other animals to death or extinction.

In this activity, the students design a kind of fish. They choose the adoptions that their fish will have. Each choice they make would actually take countless years to develop. As these adaptations become part of the fish's design, the fish becomes better suited to the habitat in which it lives. Because of the variety of conditions within each habitat, many different fish can live together and flourish.

The major purpose of this activity is for students to investigate the concept of adaptation.

Lesson Plan:

1. Conduct a class discussion on the value of different kinds of adaptations in animals and plants. As a part of the discussion ask students to identify different kinds of adaptations in humans. As a group, categorize these adaptations into the following groups: protective coloration and camouflage, body shape/forrr4 mouth type/feeding behavior, reproduction/behavior, response to heat/cold, response to dryness. Have students come up with other categories into which their organisms might fall.
2. Divide the adaptation cards into five groups of four cards each, one each of coloration, mouth type, body shape and reproduction.

3. Pass one complete set of cards to each group of students. There might be five groups with four to six students in each group.

4. Ask students to “fashion a fish7' from the characteristics of the cards in the set they receive. Each group should create an art form that represents their fish, name the fish using appropriate binomial nomenclature, describe and draw the habitat for their fish.

5. Ask each group to report to the rest of the class about the attributes of the fish they have designed, including identify and describing its adaptations. Ask the students to describe how this kind of fish is adapted for survival.

6. Discuss as a group, the importance of adaptations in fish and other organisms and the process by which this might occur.

FASHION A FISH
Adapted from Project Wild Aquatic

OBJECTIVES

Skills:
Students will: 1) describe adaptations of fish to their environments; 2) describe how adaptations can help fish survive in their habitat; and 3) interpret the importance of adaptations in animals.

Method:
Students design a variety of fish adapted for various aquatic habitats.

Background:
Aquatic animals are the product of countless adaptations over long periods of time. These adaptations, for the most part, are features that increase the animals likelihood of surviving in their habitat.

When a habitat changes, either slowly or catastrophically, the species of animals with adaptations that allow them many options are the ones most likely to survive. Some species have adapted to such a narrow range of habitat conditions that they are extremely vulnerable to change. They are over-specialized and are usually more susceptible than other animals to death or extinction.

In this activity, the students design a kind of fish. They choose the adaptations that their fish will have. Each choice they make would actually take countless years to develop. As these adaptations become part of the fish's design, the fish becomes better suited to the habitat in which it lives. Because of the variety of conditions within each habitat, many different fish can live together and flourish. Some adaptations of fish are shown in the table that follows.

Subject: Science, Art
Skills: analysis, application, classification, communication, description, drawing, identification, inference, invention, public speaking, reporting. smallgroup work
Duration: two 30 to 45-minute periods for older students; one or two 20-minute periods for younger students
Group Size: any; groups of four students each
Setting: indoors or outdoors
Key Vocabulary: adaptation, coloration, camouflage
Appendices: local resources

Materials:
Five cared for each adaptation from the maters povided: Mouth body shape, coloration, reproduction; art materials; paper.

NOTE: Body shape and coloration are the only cards needed for younger students.

Activity

1. Assign students to find a picture or make a drawing of a kind of animal that has a special adaptation for example, long necks on giraffes for reaching high vegetation to eat, large eyes set into feathered cones in the heads of owls to gather light for night hunting.

2. Conduct a class discussion on the value of different kinds of adaptations to animals. As a part of the discussion, ask the students to identify different kinds of adaptations in humans.

3. Pool all of the students' pictures or drawings of adaptations. Categorize them into the following groups:

- protective coloration and camouflage
- body shape/form
- mouth type/feeding behavior
- reproduction/behavior
- other (one or more categories the students establish, in addition to the four above that will be needed for the rest of the activity)

4. Divide the adaptation cards into five groups of four cards each, one each of coloration, mouth body shape and reproduction.

5. Pass one complete set of cards to each group of students. There might be five groups with four to six students in each group. If the class size is larger than about 30 students, make additional sets of adaptation cards.

6. Ask the students to "fashion a fish" from the chacteristics of the cards in the set they receive. Each group should:

- create an artform that represents their fish
- name the fish
- describe and draw the habitat for their fish class

7. Ask each group to report to the rest of the about the attributes of the fish they have designed, including identifying and describing its adaptations. Ask the students to describe how this kind of fish is adapted for survival.

8. Ask the students to make inferences about the importance of adaptations in fish and other animals.

Extensions

1. Take an adaptation card from any category and find real fish with that adaptation!

NOTE: A collection of books about fish is useful. Do not be as concerned about reading level as much as profuse illustrations.

2. Look at examples of actual fish. Describe the fish's "lifestyle" and speculate on its habitat by examining its coloration, body shape and mouth.

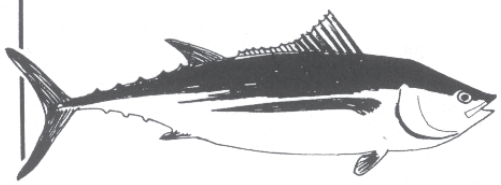
For Students

1. Name two fish adaptations in each of the following categories: mouth, shape, coloration, reproduction. Then describe the advantages of each of these adaptations to the survival of the fish in their habitats.

2. Invent an animal that would be adapted to live on Your school grounds. Consider mouth, shape, coloration, reproduction. food, shelter and other characteristics. Draw and describe your animal.

ADAPTATION	ADVANTAGE	EXAMPLES
• sucker shaped mouth	• feeds on small plants/animals	• sucker, carp
• elongate upper jaw	• feeds on prey it looks down on	• spoonbill, sturgeon
• elongate lower jaw	• feeds on prey it sees above	• barracuda, snook
• duckbill jaws	• grasps prey	• muskellunge, pike
• extremely large jaws	• surrounds prey	• bass, grouper
Body Shape		
• torpedo shape	• fast moving	• trout, salmon, tuna
• flat bellied	• bottom feeder	• catfish, sucker
• vertical disk	• feeds above or below	• butterfish, bluegill
• horizontal disk	• bottom dweller	• flounder, halibut
• hump backed	• stable in fast moving water	• sockeye salmon, chub, razorback
Coloration		
• light colored belly	• predators have difficulty seeing it from below predators	• most minnows, perch, tuna, mackerel
• dark upperside	• have difficulty seeing it from above	• bluegill, crappie, barracuda, flounder
• vertical stripes		• muskellunge, pickerel, bluegill
• horizontal stripes	• can hide in vegetation	• yellow and white bass, snook
• mottled coloration	• can hide in vegetation	• trout, grouper, rockbass, hogsucker
	• can hide in rocks and on bottom	
Reproduction		
• eggs deposited in bottom	• hidden from predators	• trout, salmon, most minnows
• eggs deposited in nests	• protected by adults	• bass, stickleback
• floating eggs	• dispersed in high numbers	• striped bass
• eggs attached to vegetation	• stable until hatching	• perch, northern pike, carp
• live barriers	• high survival rate	• guppies

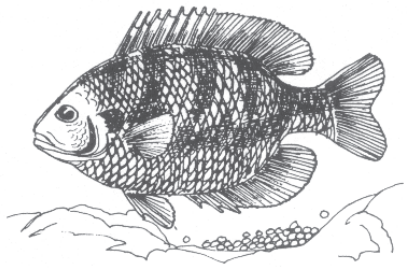
Coloration



Light Colored Belly (Albacore)

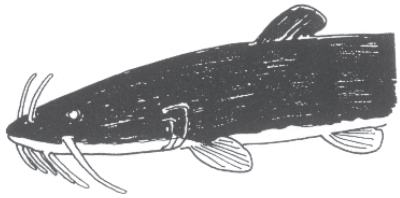
Reproduction

Eggs Deposited in Nests (Blue Gill)

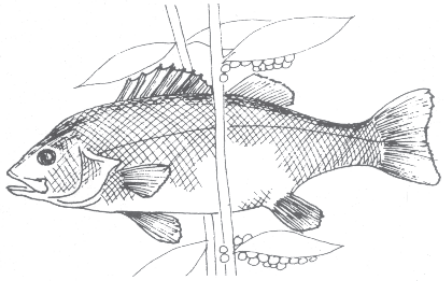


Coloration

Dark Upperside (Catfish)

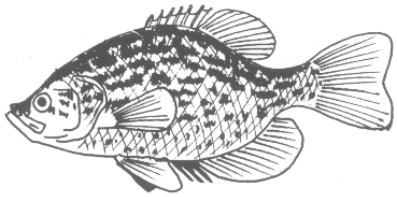


Reproduction



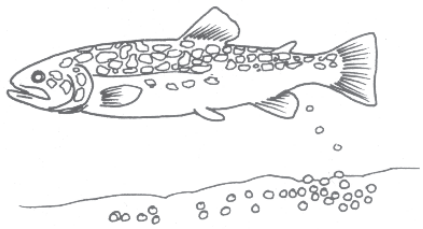
Eggs Deposited on Vegetation (Yellow Perch)

Coloration



Mottled (Crappie)

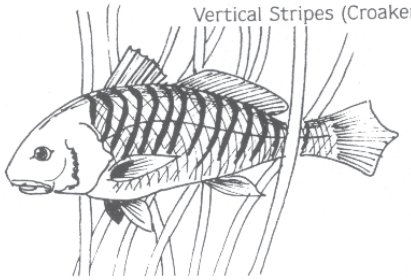
Reproduction



Eggs Deposited on Bottom (Trout)

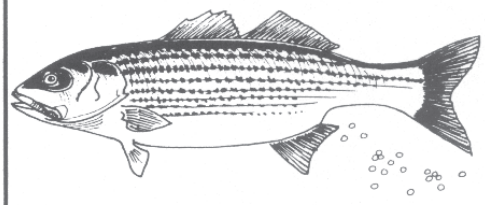
Coloration

Vertical Stripes (Croaker)



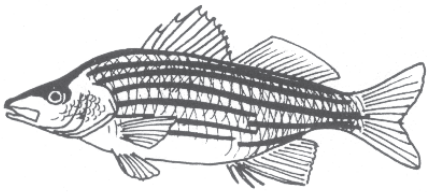
Reproduction

Free Floating Eggs (Striped Bass)



Coloration

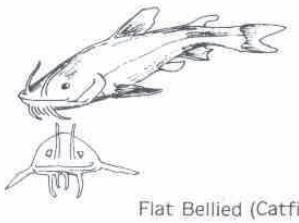
Horizontal Stripes (Yellow Bass)



Reproduction

Live Birth (Gambusia)

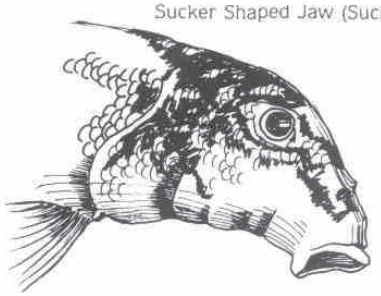
Shape



Flat Bellied (Catfish)

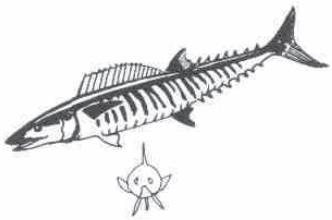
Mouth/Feeding

Sucker Shaped Jaw (Sucker)



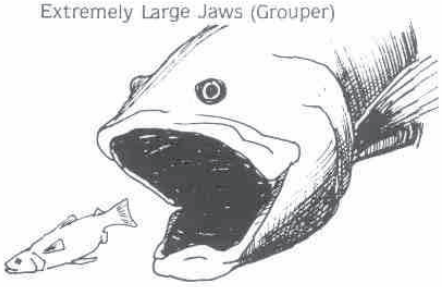
Shape

Torpedo Shape (Wahoo)



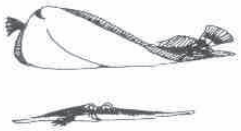
Mouth/Feeding

Extremely Large Jaws (Grouper)



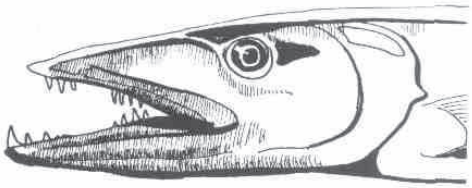
Shape

Horizontal Disc (Halibut)

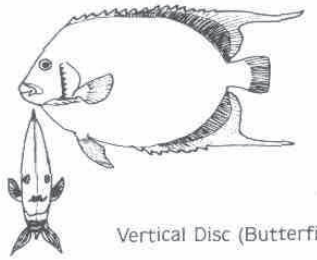


Mouth/Feeding

Elongate Lower Jaw (Barracuda)



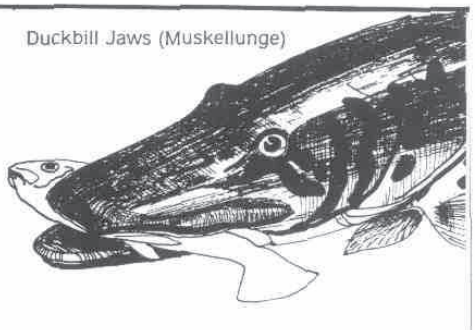
Shape



Vertical Disc (Butterfish)

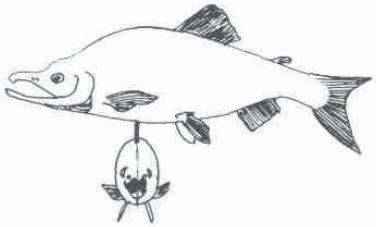
Mouth/Feeding

Duckbill Jaws (Muskellunge)



Shape

Humpbacked (Sockeye)



Mouth/Feeding

Elongate Upper Jaw (Cod)